REMARKS

Claims 1-28 are presently pending in the application. Claims 23-28 have been added. Reconsideration and allowance of all claims are respectfully requested in view of the following remarks.

As a preliminary matter, the Applicants thank the Examiner for his courtesy during the personal interview conducted on September 29, 2006. In that interview, the Applicants argued that the disclosure provides adequate antecedent basis for the subject matter of Claims 11 and 22, and also that the claims distinguished over Neal and Schütze. In particular, the Applicants argued that the present invention generates a plurality of beamlets from a single laser beam using a diffractive optical element, each of the beamlets which form a separate optical trap – contrary to the teachings of the applied prior art. The Examiner stated that he would take this description under advisement, but no agreement was reached.

Objections to the Specification

The Examiner has objected to the specification and the drawings, stating that the disclosure does not provide antecedent basis for the subject matter of Claims 11 and 22, and that the specification and drawings fail to show or recite the diffractive optical element (DOE) being positioned in the back focal plane of the focusing element.

First, the Applicants respectfully submit that the claimed features of the DOE being positioned in the back focal plane of the focusing element is part of the original specification, as they are recited in the original claims, and, in addition, are referred to in the specification in paragraph 0044; thus, providing proper antecedent basis for the claimed subject matter.

Second, the Examiner alleges that the back focal plane of the focusing element (objective lens 20) is between lenses L1 and L2, which is incorrect. Claims 11 and 22 have been amended to more clearly define that the DOE is disposed in a plane of the back aperture of the focusing element, as disclosed in paragraph 0044, and as shown in Figure 3B.

Accordingly, the Examiner's objection to the specification should be withdrawn.

Claim Rejections Under 35 USC § 103(a)

The Examiner has rejected Claims 1-2, 4, 6-9, 12-13, 15, and 17-20 under 35 U.S.C. §103(a) as being unpatentable over Neal (U.S. Patent No. 5,939,716), of record, in view of Schütze (U.S. Patent No. 5,689,109), of record. Further, Claims 3 and 14 were rejected under 35 U.S.C. §103(a) as being unpatentable over Neal in view of Schütze as applied to Claims 1 and 12 above, and further in view of Long (U.S. Patent No. 5,986,781), of record. Claims 5 and 16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Neal in view of Schütze as applied to Claims 1 and 12 above, and further in view of Sasaki et al. (K. Sasaki, M. Koshioka, H. Misawa, N. Kitamura, H. Masuhara, "Pattern formation and flow control of fine particles by laser-scanning micromanipulation", Opt. Lett. Vol. 16, No. 19, October 1, 1991, pp. 1463-1465), of record. Claims 10 and 21 were rejected under 35 U.S.C. §103(a) as being unpatentable over Neal in view of Schütze as applied to Claims 1 and 12 above, and further in view of Sasaki et al. Finally, Claims 11 and 22, as best understood, are rejected under 35 U.S.C. §103(a) as being unpatentable over Neal in view of Schütze.

For the following reasons, the prior art rejections are respectfully traversed.

The Applicants respectfully submit that neither the individual nor the combination of the Neal and Schütze references teaches or suggests a method for manipulating a plurality of particles by forming and moving a plurality of optical traps, including applying the at least one laser beam to a diffractive optical element for simultaneously creating a plurality of separate laser beams from each laser beam; establishing an optical gradient for each of the plurality of separate laser beams to each separate optical trap for moving the plurality of particles; and performing a manufacturing process which changes the position of at least one of the plurality of particles, as recited in Claim 1, and as substantially recited in Claim 12.

Rather, as stated previously in the Amendment dated May 18, 2006, which arguments

Applicants respectfully incorporate in their entirety, Neal is directed to a method and apparatus for containing a single reflective particle in a single light cage, by using at least three focused light beams to form the light cage and to trap a single particle.

Specifically, Neal teaches that "at least three focussed beams are required to provide passive stability within the light cage 10, with greater stability being achieved as the number of focussed beams is increased" (see col. 5, lines 63-67). However, only a single particle is trapped within the single light cage 10 formed by the three focussed beams in Neal.

Thus, the diffraction element 18 in Neal cannot be said to "simultaneously" create a plurality of separate laser beams from each laser beam, to each form a separate optical trap, as claimed in the present invention.

Further, the diffractive optical element being a time-addressable phase shifting medium, or a computer-generated hologram, or a dynamically changing diffractive component enabling dynamically changing optical traps to be formed, or a liquid crystal phase array imprinted with computer-generated holographic patterns, as recited in Claims 3, 14, and 23-28, are not disclosed in Neal, or Schütze (which discloses no diffractive optical element).

Further, although Schütze discloses generating a plurality of optical traps, the traps are generated using a plurality of lasers 3, 4, which generate a plurality of beams of different wavelengths, which is contrary to the teachings of Neal. Rather, Neal specifically states that "(t)he present invention is a method and apparatus for trapping a reflective ... particle without the use of a scanning mirror, multiple light sources, or active feedback control mechanism" (emphasis added).

Further, the plurality of beams from the plurality of lasers 3, 4 are not generated using a diffractive optical element, but simply by using a beam splitter 16 in Schütze.

Still further, the complicated arrangement in Schütze, of a plurality of lasers

generating a plurality of laser beams of a first wavelength range and a second wavelength range, which, in addition with beams from an observation light, are used independently of one another to influence movement of particles, is complete in itself, and directed to a different structural apparatus from that of the present invention and that of Neal. Thus, Schütze has no relevance to the present invention, or even that of Neal.

Accordingly, there is no motivation to combine Schütze with Neal, and even if so combined, would not achieve the claimed features of the present invention.

The Applicants respectfully remind the Examiner that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). Since Neal specifically teaches away from using multiple light sources, and since the references achieve trapping of particles in completely different ways, there is no motivation to combine Schütze with Neal in order to achieve the claimed features of the present invention.

Accordingly, the present invention is not obvious over either the individual or the combination of the Neal and Schütze references, and the rejection of Claims 1 and 12 under 35 U.S.C. §103 should be withdrawn.

The Examiner has rejected Claims 3 and 14 under 35 U.S.C. §103(a) as being unpatentable over Neal and Schütze in view of Long (U.S. Patent No. 5,986,781).

With respect to Claims 3 and 14, the addition of the Long reference does not make up for the deficiencies in Neal and Schütze.

Accordingly, Claims 3 and 14 are patentable over either the individual or the combination of the Neal, Schütze, and Long references, and the rejection of Claims 3 and 14 under 35 U.S.C. §103 should be withdrawn.

Claims 5 and 16 were rejected under 35 U.S.C. §103(a) as being unpatentable over Neal and Schütze in view of Sasaki et al.

The addition of the Sasaki et al. reference does not make up for the deficiencies in Neal and Schütze.

Accordingly, Claims 5 and 16 are not obvious over either the individual or the combination of the Neal, Schütze, and Sasaki et al. references, and the rejection of Claims 5 and 16 under 35 U.S.C. §103 should be withdrawn.

Claims 10 and 21 were rejected under 35 U.S.C. §103(a) as being unpatentable over Neal and Schütze in view of Sasaki et al.

The Applicants' respectfully submit that one of ordinary skill in the art would not have combined the Neal, Schütze, and Sasaki et al. references, since Schütze is silent with respect to this feature, and Neal clearly teaches away from the use of scanning mirrors (see col. 5, lines 43-46), on which the Examiner relies in Sasaki et al. for use in combination with Neal.

Accordingly, Claims 10 and 21 are not obvious over either the individual or the combination of the Neal, Schütze, and Sasaki et al. references, and the rejection of Claims 10 and 21 under 35 U.S.C. §103 should be withdrawn.

Finally, the Examiner has rejected Claims 11 and 22 under 35 U.S.C. §103(a) as being unpatentable over Neal and Schütze.

Further, since Claims 2-11 depend from Claim 1, and Claims 13-22 depend from Claim 12, they are also patentably distinguishable over Neal and Schütze for the reasons cited above with respect to Claims 1 and 12.

With respect to new Claims 23-28, since they depend from Claims 1 and 12, they are

also patentable over the applied prior art for the reasons cited above with respect to Claims 1 and 12.

If the Examiner believes that there is any issue which could be resolved by a telephone or personal interview, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

Applicants hereby petition for any extension of time which may be required to maintain the pendency of this case, and any required fee for such an extension is to be charged to Deposit Account No. 04-1061.

Respectfully submitted,

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